WHAT IS CLAIMED IS:

1. A method for making mixed-metal particles, comprising:

preparing a solution selected from the group consisting of a solution comprising two or more dissolved metals and/or metal-containing compounds comprising metals selected from Group IIB, a solution comprising two or more dissolved metals and/or metal-containing compounds comprising at least one each metal selected from Groups IB and IIIB, and a solution comprising two or more dissolved metals and/or metal-containing compounds comprising at least one each metal selected from Groups IIIB and IVB;

forming droplets of the solution; and

heating the droplets to pyrolyze the contents of the droplets to form mixed-metal particles.

2. A method according to claim 1, wherein the mixed-metal particles are a single-phase metal oxide.

3. A method according to claim 1, wherein the mixed-metal particles comprise multiple metal oxide phases.

4. A method according to claim 1, wherein the mixed-metal particles comprise a metal oxide phase and a non-oxide phase.

5. A method according to claim 1, wherein the mixed-metal particles are multinary metallic particles.

6. A method according to claim 1, wherein the mixed-metal particles comprise at least one phase substantially enveloping at least one other phase

7. A method according to claim 1, wherein the particles comprise Cu and In and have an average diameter of less than about 1 micron.

8. A method according to claim 1, wherein the particles comprise Cu, In and Ga.

9. A process for making a mixed-metal compound material, comprising:

reacting (a) a precursor material comprising multi-phase, mixed-metal particles comprising a metal oxide phase, with (b) at least one reactant material, to form a mixed-metal compound material.

10. A process according to claim 9, wherein the multi-phase, mixed-metal particles comprise multiple metal oxide phases.

11. A process according to claim 9, wherein the multi-phase, mixed-metal particles comprise at least one phase substantially enveloping at least one other phase.

12. A process according to claim 9, wherein the precursor material comprises multi-phase particulate materials and other particulate materials.

13. A process according to claim 9, wherein the reactant materials are present as particles admixed with the precursor material or as layers overcoated on to the precursor material.

14. A process according to claim 9, wherein the mixed-metal compound material is a Group VB or VIB compound material and wherein at least one of the reactant materials comprises one or more Group VB or VIB elements.

15. A process according to claim 9, wherein the particles comprise one or more elements from Groups IB and/or IIIB.

16. A process for making a mixed-metal compound material, comprising:

reacting (a) a precursor material comprising multi-phase, mixed-metal particles comprising a metal oxide phase and a non-oxide phase, with (b) at least one reactant material, to form a mixed-metal compound material.

17. A process according to claim 16, wherein the non-oxide phase comprises a

metal phase.

18. A process according to claim 16, wherein the non-oxide phase is a non-oxide chalcogenide compound.

19. A process according to claim 16, wherein the multi-phase, mixed-metal particles comprise at least one phase substantially enveloping at least one other phase.

20. A process according to claim 16, wherein the precursor material comprises other particulate materials in addition to the multi-phase, mixed-metal, particulate materials.

21. A process according to claim 16, wherein the precursor material is deposited as one or more layers on a substrate.

22. A process according to claim 16, wherein the reactant materials are present as particles admixed with the precursor material or as layers overcoated on the precursor material.

23. A process according to claim 16, wherein the mixed-metal compound material is a Group VB or VIB compound material and wherein at least one of the reactant materials comprises one or more Group VB or VIB elements.

24. A process according to claim 16, wherein the particles comprise one or more elements from Groups IB and/or IIIB.